1933

Inorganic Chemistry (2nd Year): Technical School Examinations 1933

Department of Education: Technical Instruction Branch

COURSES IN APPLIED CHEMISTRY.

AN ROINN OIDEACHAIS.
(Department of Education.)
BRAINSE AN CHEARD-OIDEACHAIS.
(Technical Instruction Branch.)

TECHNICAL SCHOOL EXAMINATIONS.
1933.

INORGANIC CHEMISTRY.
(Second Year.)

Tuesday, May 9th—7 *to* 10 *p.m.*

Examiner—A. G. G. LEONARD, ESQ., PH.D., F.R.C.SC.I., F.I.C.
Co-Examiner—E. P. BARRETT, ESQ., B.A., B.SC.

GENERAL INSTRUCTIONS.

You are carefully to enter on the Answer Book and Envelope supplied your Examination Number and the subject of examination, but you are not to write your name on either. No credit will be given for any Answer Book upon which your name is written, or upon which your Examination Number is not written.

You must not have with you any book, notes, or scribbling-paper.

You are not allowed to write or make any marks upon your paper of questions.

You must not, under any circumstances whatever, speak to or communicate with another candidate ; and no explanation of the subject of the examination may be asked for or given.

You must remain seated until your answer-book has been taken up, and then leave the examination-room quietly. You will not be permitted to leave before the expiration of twenty minutes from the beginning of the examination, and will not be re-admitted after having once left the room.

If you break any of these rules, or use any unfair means, you are liable to be dismissed from the examination, and your examination may be cancelled by the Department.

Three hours are allowed for this paper. Answer-books, unless previously given up, will be collected at 10 *p.m.*

INSTRUCTIONS.

Read the General Instructions on page 1.

(*a*) Equal values are attached to the questions.

(*b*) Answers must be written in *ink*.

(*c*) Write the number of the question distinctly in the margin of your paper before the answer.

(*d*) *Eight* questions only may be attempted.

(*e*) *In all cases definite chemical changes should be expressed by equations.*

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1. A metallic chloride contains 88·75 per cent. of chlorine. It vaporizes without decomposition and has a relative density of 40 in the gaseous state. Find the equivalent and atomic weights of the metal. H=1; Cl=35·5.

2. Give an account of two methods which have been employed for the liquefaction of gases.

Explain the meaning of "critical temperature."

3. How is silicon fluoride prepared? What products are formed when it reacts with water? Give equations.

4. 0·396 gm. of an ammonium salt was boiled with excess of sodium hydroxide solution and the distillate received in 50 c.c. of semi-normal sulphuric acid. After the distillation the acid required 40 c.c. of 0·95 semi-normal sodium carbonate for neutralization. Find the percentage of nitrogen in the salt.

H=1; N=14; O=16; S=32.

5. Describe concisely the manufacture of coal gas and mention three by-products obtained.

6. What is fuming sulphuric acid? How is it prepared commercially? Mention two purposes for which it is employed in industry.

7. How is phosphorus prepared? Give an account of industrial uses of phosphorus compounds.

8. State the Law of Mass Action and explain the meaning of the terms "velocity constant" and "equilibrium constant."

9. What impurities may commonly occur in natural (fresh) waters?

Which of these would you consider undesirable in (*a*) drinking water, (*b*) water for use in a steam boiler? Give reasons for your answers.

10. Describe in detail a delicate test for the detection of arsenic compounds.